MECHANICAL DATA SHEET

SHELL AND TUBE HEAT EXCHANGER

Plant Item No.
24590-PTF-MB-FEP-RBLR-00001A

Data Sheet No.
24590-PTF-MED-FEP-P0009

Project:	**RPP-WTP**	Description:	**Waste Feed Evaporator Reboiler**
Project No.	**24590**	P&ID:	**24590-PTF-M6-FEP-P0002**
Site:	**Hanford**	Process Data Sht:	**24590-PTF-MEC-FEP-00001**
Process flow diagram:	**24590-PTF-M5-V17T-P0004002**	Manufacturer Name	**Framatome ANP / Northwest Copper Works, Inc.**

ISSUED BY RPP-WTP PDC INIT DATE

General Data

Quality Level	**QL-1**	TEMA (Class/Type)		**B**	
Seismic Category	**SC-II**	Flow Type (Counter current, etc)		*	
Design Code	**ASME VIII, Div 1**	Heat Exchanger Duty	Btu/hr	**18,350,000****	
Code Stamp	**Yes**	Heat Exchanger Area	ft^2	**2582****	
NB Registration	**Yes**	ΔT (LMTD/Corrected LMTD)	°F	*	*

Thermal/Hydraulic Data

	Shell Side		Tube Side	
Fluid Name	**Steam**		**Waste Feed Recirculation**	
Fluid Quantities: Total lbm/hr	**17,012****		*	
Condensable Vapor (In/Out)	*	•	*	•
Liquid	*	*	*	*
Noncondensable	*	*	*	*
Temperature (In/Out) °F	*	*	*	*
Specific Gravity	*	*	*	**1.50**
Viscosity cP	*	*	*	**12**
Molecular Weight, Vapor	*	*	*	*
Molecular Weight, Noncondensable	*	*	*	*
Specific Heat Btu/lbm-°F	*	*	*	*
Thermal Conductivity Btu/hr-ft-°F	*	*	*	*
Latent Heat Btu/lbm @ °F	*		*	
Inlet pressure psia	**7.88****		*	
Tube side Velocity ft/s	*		*	
Pressure Drop (Actual) psi	*		*	
Fouling Resistance (Min) $hr\text{-}ft^2\text{-}°F/Btu$	**0.0015****		**0.007 ****	

Note: Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

EXPIRES 12/10/04

This Bound Document Contains a Total of 2 Pages.

Rev	Description	By	Checked	Approved	Date
0	Issued for Permitting Use	E. Le	D. Reinemann	J Julyk	3/17/04

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Mechanical Data

		Shell Side		Tube Side	
Design Pressure (Max/Min)	psig	50	Full vacuum	50	Full vacuum
Design Temperature (Max/Min)	°F	311	49	311	49
Corrosion Allowance	inch	N/A		0.04	
Erosion Allowance	inch	N/A		N/A	
Shell OD/ID	inch	72**		Overall Dimensions (H x W x L) inch	72x72x180**
Total No. of Tubes		822*		Tube OD inch	1.5 ** inch

Material Data

Shell	SA 240 304L SS	Shell Cover	SA 240 304L SS
Channel/Bonnet	Alloy G-30	Channel Cover	Alloy G-30
Tube	Alloy G-30 (seamless)	Floating Head Cover	N/A
Stationary Tube Sheet	Alloy G-30	Floating Tube Sheet	N/A
Shell Side Gaskets	N/A	Tube Side Gaskets	N/A
Partition Seals	N/A	Baffles/Supports	SA 240 304
Insulation	N/A	Forgings (Shell side)	SA 182 F304 (max. carbon 0.030%)
Bolting	N/A	Forgings (Channel)	Alloy G-30

Construction Data *(To be determined by the supplier when not specified by the buyer)*

Cross Baffle Type	*	% Baffle Cut (Dia.)	*	Spacing (c/c) inch	*
Bypass Seal Arrangement	*	Longitudinal Seal Type	*	Expansion Joint Type	*
Inlet Nozzle ρV^2	*	Bundle Entrance ρV^2	*	Bundle Exit ρV^2	*
Tube Support Type	*	U-bend Support Type	*	Weight of Bundle lbf	*
Operating Weight lbf	*	Full of Water lbf	*	Weight of Shell lbf	*

Notes

* To be determined by Seller
** To be verified by Seller

Notes: (1) All welds are continuous to avoid crevices, weld surface finish is descaled as laid.
(2) All welded construction on both tube and shell sides
(3) Tubes welded to the tubesheets with full strength welds.